MC0054

HOSPITAL BUILDING NOTE

THE COST OF HOSPITAL BUILDINGS

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The Cost of Hospital Buildings

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I. Introduction

This Building Note introduces a method of assessing the cost of new hospital buildings, whether on new sites or as part of the redevelopment of existing hospitals. Other Building Notes which deal with the requirements of the various hospital departments are being prepared in a way which will enable this method to be applied as buildings are planned.

II. The components of the cost of hospital buildings

Content

The cost of building and engineering work at hospitals is made up of the following components (see Figure 1):

(A) the cost of the main buildings, including electrical and mechanical work within them;

(B) that of auxiliary buildings such as garages, bicycle shelters and covered ways;

(C) that of external works, i.e. building works and engineering works, and

(D) abnormals, including alterations to existing buildings, unusual site conditions, etc.

When the cost is divided into these components, which are examined below, it becomes easier to see the relation of each to the whole and whether in particular projects value is being obtained for the money spent.

(A) THE MAIN BUILDINGS

The main buildings are of two types: single department buildings, which contain one department only and are detached from the other buildings on the site such as nurses' homes and central boiler-houses; and multi-department buildings. Most of the departments in a hospital are in this latter type of building. Multi-department buildings include accommodation necessary to provide access to, and communication between, the departments. In this Note this is termed "communications". The estimation and control of cost is simplified if the multi-department building is regarded as a number of separate departments linked together by communications and the cost of each department is individually considered.

The department

Studies of departments built in recent years have shown that they can conveniently be divided into:

Basic accommodation—which is always found in departments of the kind being considered and which, with the related circulation space, forms the major part of that department (normally 75 per cent-95 per cent).

Additional accommodation—which may be provided in a department in addition to the basic accommodation to meet special local needs or because the department is undertaking work outside the scope of most departments of its kind, and its related circulation space.

The area of internal circulation together with that occupied by internal walls and partitions usually varies between 25 per cent and 35 per cent of the total area of the department. The cost of a building may be largely influenced by an intelligent economy in the provision of internal circulation.

Communications

This comprises space to enable people to pass from one department to another, and lifts. It includes corridors, staircases, crush spaces and main waiting areas not within departments.

Its nature and extent will, within the conditions imposed by the site, depend on how economically the building is planned. The area of the communication space usually varies between 10 per cent and 15 per cent of the total area of a multi-department building and is therefore an important element in the cost. The demarcation between internal circulation and communication space may not always be clear. It is to some extent the result of economical planning that a corridor within a department can also be used for communication between other departments. The test is whether the corridor, etc., is necessary to the functioning of the department. If it is, it should be considered to be part of the department. If not, it should be considered to be part of "communications".

The cost of the engineering work of lifts is considered separately from that of other communications. The provision and siting of lifts should be carefully examined as their cost may be a significant item in the cost of the building.

Number of storeys

The height of buildings affects their cost. This must be taken into account with other factors before it is decided to build high buildings.

(B) AUXILIARY BUILDINGS

Bicycle shelters, electric sub-stations, meter houses, etc., are often, because of site conditions, housed in separate small buildings on the hospital site. As they are small and of simple construction they are not normally a major factor in the cost.

(C) EXTERNAL WORKS

These consist of two broad classes:

(*a*) *Building*

(i) Drainage.

(ii) Roads, paths, pavings, boundary walls and fences.

(iii) Builder's work in connection with engineering supplies and works (item (*b*) below).

(iv) Site layout and planting.

(*b*) *Engineering*

(i) *Supplies*

This term includes all the engineering mains outside the confines of particular departments including any new or reinstated mains which are needed in existing buildings to serve new work. It includes cold water mains and storage, steam and condense mains, electricity cables and additional works such as calorifiers, pumps or new boilers or sections added to an existing installation.

(ii) *Other engineering*

This includes street-lighting, static water tanks and external fire hydrants.

The amount of the external works may vary from complete provision on a new site to comparatively minor works on an existing site.

Complete new boiler plant installations are treated as a hospital department.

(D) ABNORMALS

These are peculiar to the site and their cost should always be considered and estimated as closely as possible in the light of the available information. Examples are works to or demolition of existing buildings on the site, excavation in rock and unusual site and local conditions.

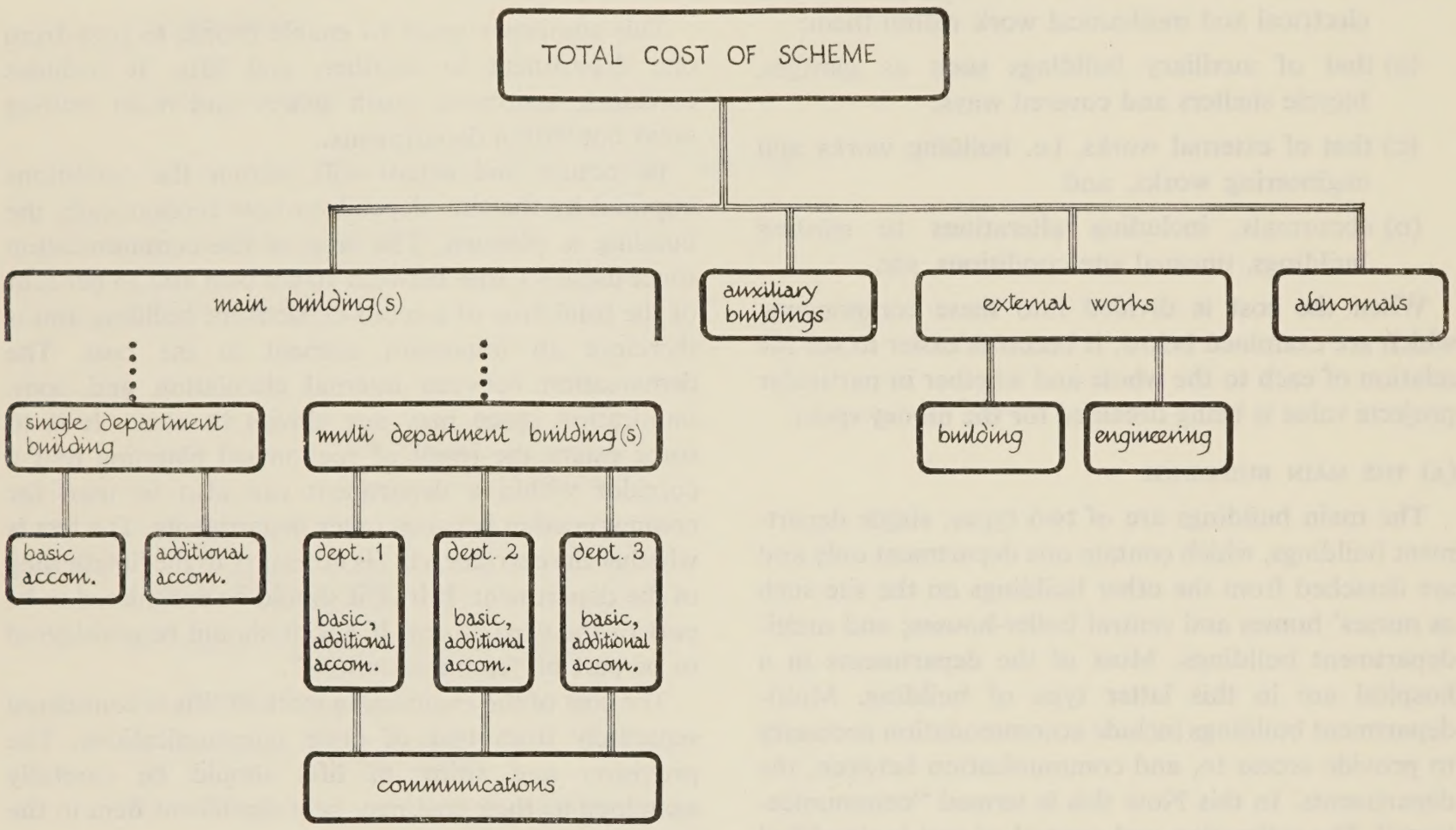

FIGURE 1. The cost components of a scheme.

III. Calculation of the cost

Cost studies

Studies have been made in the Ministry of the cost of a considerable number of hospital departments built in recent years and of others not yet completed. The costs of the completed buildings were taken from approved tenders and for the purpose of comparison were adjusted to take account of the varying dates at which the tenders were received. Adjustments were made to allow for changes in practice since the scheme being studied was designed and for any deficiencies in the accommodation provided. While final account figures might have been slightly more reliable, the tender figures were chosen because more were available for study. The costs were divided between the components previously described.

Analyses were also made of the work carried out in each department examined and it was usually found possible to relate the total cost for the basic accommodation to the "function" or work load of the department and to express this cost in terms of "functional units". Thus, the cost of the basic accommodation in a ward unit could be expressed as "cost per bed" and in kitchens, as of "cost per meal". The simplest suitable functional unit was chosen for each department.

From comparison of these analyses the following information was obtained:

(*a*) The cost for the basic accommodation within each department expressed in terms of "functional units".

(*b*) Average costs for additional accommodation within each department expressed in terms of rates per square foot.

(*c*) Information on:

(i) the proportion of the internal circulation to the basic and additional accommodation within the various departments;

(ii) the average proportion of building work to engineering work in each department;

(iii) the additions needed for communications;

(iv) average cost of external works, building and engineering.

From this information cost recommendations have been evolved for a number of departments. These are set out in Appendix E.

Recommendations for other departments will be published from time to time as addenda to Appendix E.

The use of the cost information

The cost recommendations should be used by Hospital Boards at two stages when preparing hospital building schemes: to provide a figure of cost for the schedule of accommodation (*a provisional cost limit*) and to give a firm cost of the scheme at sketch plan stage (*final cost limit*).

Cost limits for a complete scheme should be prepared in two broad divisions:

Departmental costs—The cost of each department in the scheme divided into basic and additional accommodation. Guidance on the content of each department, description of the basic accommodation needed and the additional accommodation most commonly provided, with information on planning and on engineering services is being given in other Building Notes.

Other costs—which will show the remaining elements in the cost of the schemes such as communications between departments or between new accommodation and the existing building, and external works, abnormals, etc. The cost of fees, loose furniture, fittings and equipment has been excluded.

The following points should be noted:

Basic accommodation. The departmental cost allowances which are related to the functional unit for the department cover building and engineering costs, including the cost of the internal circulation associated with the basic accommodation.

Additional accommodation. This recommendation is given as a cost per square foot. In calculating the cost of additional accommodation within a department due allowance should be made for the area of any additional internal circulation and also for the plan area of internal partitions required by this accommodation.

Cost of communications. In order to obtain provisional cost limits (i.e. before sketch plans have been prepared) a percentage addition on the gross cost of the departments included in a multi-department building should be made for the cost of communications excluding the engineering costs of lifts (see Appendix E).

When sketch plans have been prepared the actual area of these communications should be measured and priced at a realistic rate.

At the provisional cost stage assessment of the number and capacity of lifts and their cost is difficult. It is necessary, none the less, that an assessment be made in the provisional cost limits. At the final cost limit stage the cost should be accurately estimated in the light of the further information then available. Appendix E suggests how the assessment of cost should be made.

Number of storeys. The very considerable influence of the number of storeys on the cost of building should be taken into account when the height of the project is under consideration and when provisional and final cost limits are prepared (see Appendix E).

Auxiliary buildings. When provisional cost limits are drawn up, an assessment should be made of the extent of the auxiliary buildings required and an estimate prepared. For the final cost limit the works should be accurately estimated.

Cost of external works. The token allowances suggested in Appendix E for percentage additions for external works should be used in calculating provisional cost limits only. At later stages in the planning when fuller information is available detailed estimates of the amounts of building and engineering work should be made.

Abnormals. Where abnormals are expected it is important that some allowance should be made in the provisional cost limits for these items. They can be accurately assessed at a later stage.

The presentation of cost limits of building schemes

Cost limits for hospital building schemes should be presented at two stages using the cost recommendations in Appendix E:

(i) A provisional cost limit should be calculated as soon as the need and schedules of accommodation have been settled.

(ii) A final cost limit at sketch plan stage. The final cost limit will become the firm estimate for the scheme and the Hospital Board will be expected to obtain tenders within it.

The method of presenting cost at the two stages is the same, but the calculations for the final cost limit will be the more accurate since they will take account of firm details of the accommodation and engineering works, site works and site peculiarities.

At both stages the cost of each department in the project will be required, divided between basic and additional accommodation, together with details of the cost of other items of the work, such as communications between departments, height, auxiliary buildings, external works, engineering supplies and site abnormals.

Sketch plans should show (and the final cost limit should take into account) the rooms and spaces provided for the engineering plant and equipment and the nature of the engineering works.

With the final cost limit the percentage division between building, engineering and fixed equipment costs will be required. The architect, engineer and quantity surveyor will have to consult together to

ensure that the division is realistic and will be adhered to at all stages of working up the scheme.

The use of cost limits should avert procedural delays when building schemes are considered by Hospital Boards and the Ministry, because when the architect and engineer are preparing their designs they will have an overall cost figure to which their solutions should conform and subsequent variations in cost should be exceptional. The final cost limit should be adhered to and it should not normally be necessary for Boards to seek approval from the Ministry to alter it.

For works solely of an engineering nature, such as the modernisation and renewal of existing mains, the cost of the work can only be accurately assessed after a survey on the site. It is however desirable that a provisional estimate should be included in the provisional cost limit. The final cost limit should include a reliable figure within which the Hospital Board intend to carry out the scheme.

Examples are given in Appendix D of the way in which a provisional cost limit and a final cost limit should be prepared, with a specimen Schedule of Accommodation for one department. The example showing the final cost limit illustrates how the increased knowledge of site conditions at the sketch plan stage is reflected in the cost of the additional accommodation and other items.

Checking the cost of schemes

Hospital Boards should ensure by normal estimating methods that any proposed project can be carried out for the sum included in the final cost limit and any necessary adjustments to design and specification should be made before the submission of sketch plans and the final cost limit to the Ministry.

Methods which may be adopted after the final cost limit has been agreed to ensure that the scheme is carried out within the final cost limit are suggested below.

IV. Cost control

Cost plan

When a final cost limit has been agreed the Hospital Board should ensure that the project is completed within it. This can best be achieved by the application of cost control during the detailed planning.

The normal basis of cost control is a *cost plan* which specifies how the money available is to be spent. This shows not only the allocation of money between the buildings, external works and any other major cost components of the scheme, but also details the sub-division to the "elements" of the building, e.g. walls, ground and upper floors, roof, etc. These elements are set out in Appendix B.

The division of the expenditure between the various buildings, etc., in a project is usually based on the figures used in building up the final cost limit. The architect, engineer and quantity surveyor must first decide how the money for a department or building is to be distributed over the elemental parts of that building. This sub-division depends on the specification and design of the building and the importance that the architect and engineer attach to the various elements.

When an allocation to the elemental parts of each building has been made, the architect and engineer will be able to see which elements form an important part of the cost of the building works and engineering works respectively and which are of relatively minor cost importance. For the more extensive elements, such as external walls and roofs, small changes in specification can result in quite large savings or increases in expenditure. On the other hand, variations in the specification for the minor elements, e.g. staircases, will have a relatively small effect on the total cost of the scheme. By using his knowledge of these factors, the architect can adjust the cost plan as the planning proceeds to suit his design. In formulating a cost plan it may be found convenient to set aside a reserve within the cost limit to provide a buffer against rises in costs during the pre-contract stage and to allow some latitude in design.

Cost control should not be used so that it results in the lowering of standards, hinders the incorporation of advances in design and practice, or is achieved only with the use of inferior materials or the incorporation of engineering and other services which will subsequently be expensive to run and maintain. The intention is to ensure that the best use is made of the money available, having regard to the need for a proper balance between the costs of the various elements of the building, the maintenance of satisfactory standards of construction and finishes and the need to keep subsequent maintenance and operating costs to a minimum.

While it may be convenient in cost planning a scheme to show as a lump sum the money allocated to each element, it is advantageous for the purpose of comparison with other similar schemes to express this also as a percentage of total cost or as a rate per foot super of floor area in the building.

A system of cost control has been described in detail in Ministry of Education Bulletin No. 4—"Cost Study".

The distribution of costs of elements

When formulating a cost plan, some difficulty may be experienced in assessing the values to be allocated to each element in a building. To assist Boards some examples of analyses made in the Ministry are shown in Appendix C. These indicate comparative rates per square foot for a number of departments. It will be noted that the variations in the rates per square foot for each element in the analyses for a department indicate that at the present time there is a lack of consistency in the importance attached to the various parts of hospital buildings by designers.

While some variation may be expected to arise from the exigencies of the site and other planning considerations, cost checks carried out against the cost plan during the design stage should enable the architect

ELEMENTS	*Ward units*	*Short stay psychiatric unit*	*Diagnostic x-ray*	*Physiotherapy department*	*Kitchens*	*Dining rooms*
NON-CONSTRUCTIONAL						
1. Preliminaries and insurances						
2. Contingencies						
STRUCTURAL						
3. Work below ground floor level						
4. Frame						
5. External walls and openings						
6. External doors and windows						
7. Roof construction						
8. Roof covering and screeds						
9. Upper floor construction						
10. Staircases						
PARTITIONING						
11. Internal partitions						
12. Internal doors						
FINISHINGS						
13. Wall finishes						
14. Floor finishes						
15. Ceiling finishes						
16. Decorations						
FITTINGS						
17. Fittings						
18. Furniture and furnishings						
SERVICES						
19. Plumbing						
20. Sanitary fittings and wastes						
21. Mechanical engineering						
22. Electrical engineering						
23. Equipment						
24. Lifts						
25. Builders work in connection with engineering						

FIGURE 2. The distribution of elemental costs.

to satisfy himself that the development of his design is not resulting in extravagance in some elements and undesirable reductions in others, particularly in finishes.

The variations in the rates for particular elements tend to reduce the value of the information shown in Appendix C. A check value has therefore been given for each element in the department. This check value does not purport to be a cost limit for any element, nor an indication of a fixed standard of construction and specification. The cost of foundation, upper floor and roof elements, for instance, will vary according to the number of storeys. The check value is put forward solely as a guide to a reasonable relationship between the various elements. It is not intended to limit the freedom of choice of methods of construction and type of finish within the overall cost limit. Check values for external works have not been included as the cost of these elements depends on local considerations.

The variation in the distribution of elemental costs from one department to another is illustrated in Figure 2. This shows that the main differences between the costs per foot super of the different departments occur in three main groups of elements, viz. finishings, fittings and engineering costs. The remaining elements are reasonably consistent in value. When a cost plan is being prepared for a project comprising several departments in one building, it should be started by allocating the sums for the finishings, fittings and engineering cost elements separately to each department, the balance of the available money being distributed to the remainder of the elements in the building as a whole.

Cost checks

To ensure that tenders are obtained within the final cost limit for a project, a continuous process of cost control must be adopted as soon as the cost plan has been agreed. This is best carried out by means of approximate quantities. Cost checks should be made on the various elements of the buildings as the design unfolds by pricing the approximate quantities according to the proposed specification. This will enable comparisons to be made with the sums allotted in the cost plan for particular elements. The cost checks may sometimes indicate that changes are necessary in the cost plan. Increases should be offset by savings elsewhere in the plan so that the overall cost of the works remains the same.

Example of a cost plan

The preparation of an initial cost plan is illustrated below. This illustration is based on the hypothetical project shown in Appendix D.

The building in this project has been assumed to be a multi-department project containing wards and physiotherapy and diagnostic X-ray departments with communications. These are dealt with separately.

The sums included in the final cost limit for wards (£141,445), physiotherapy department (£24,801), X-ray department (£35,812), communications (£23,250), indicate the respective values attached to each, and are drawn from Appendix D. The cost plan must be designed to maintain and keep separate these values as far as possible.

Before attempting to set out the cost plan and allocate values it is necessary to examine how the total cost of each department is made up.

The cost of a hospital department consists of:

(*a*) A proportion of the amounts included (or likely to be included) in the contract in respect of preliminaries, insurances and contingencies.

(*b*) The cost of the structure of a single department building (which includes the elements of substructure, frame, external and load-bearing walls, floors and roof) or a proportion of the total structural cost (based on floor area) in a multi-department building.

(*c*) The cost of the "fitting out" of the structure (or that part of the structure occupied by a department in a multi-department building) to meet the needs of the department. This "fitting out" comprises the elements of internal partitions, internal doors, windows, external doors, staircases, lifts, fittings, finishes and internal engineering services. The elements of external doors, staircases and lifts are usually part of communications in a multi-department building, but in a single department building these elements may have to be allocated to a hospital department.

External works, auxiliary buildings and abnormals should not be regarded as factors in the cost of a department although they naturally affect the total cost of the scheme.

A project can be divided into the following subdivisions:

(i) Main building.

(ii) Auxiliary buildings.

(iii) External works.

(iv) Abnormals including works to existing buildings.

Items (ii) to (iv) are self-contained and are in fact the results of estimates made by the Hospital Board from a knowledge of site conditions. Cost control in respect of these items is therefore a comparatively simple matter if the estimates adequately reflect the scope of work involved, and the cost plan will merely repeat the previous estimates.

Item (i) which comprises the main building, however, is more complex and the cost plan in respect of this building must be drawn up with great care.

Applying these considerations to the project shown in Appendix D, it can be seen from the details in the final cost limit that the money available for the building is:

	£
Wards	141,445
Physiotherapy Department . .	24,801
X-Ray Department	35,812
Communications	11,250
Height factor	Nil
Total (excluding lifts) . .	£213,308
Lifts	12,000
Total (including lifts) . .	£225,308

From the schedules of accommodation and the sketch plans which accompany the final cost limit, the floor areas of the various departments can be ascertained. As schedules and sketch plans are not included in the example in Appendix "D", suitable areas have been assumed as follows:

	feet super
Wards	25,800*
Physiotherapy	5,213
X-ray	6,690
Communications	3,000
Total	40,703

*See specimen schedule of accommodation.

With the details of floor areas and the monies available it is now possible to draw up an outline cost plan for the building.

It is suggested that this first plan be based on allocating costs to the following broad elements:

Non-constructional
Structural
Staircases
Windows and external doors
Internal partitions and internal doors
Finishings
Fittings and sanitary fittings
Services
Lifts

In addition some allowance should be made for a reserve (see Cost Plan above).

The next step is to draw up a table in which the rates per square foot and total values of each broad element can be shown for each department.

Using as a guide the specimen analyses in Appendix "C", and with the sketch plan and specification in mind it is possible to enter tentative rates and total values for each of the elements for each department on this Table (illustrated in Figure 3). The total values and rates per square foot dictated by the final cost limit for each department should not be exceeded.

First attempts at completing the plan may not always be successful and adjustments may have to be made to each elemental value, department by department, until a cost plan which does not exceed the money available and which has been agreed by all concerned in the design of the scheme has been evolved.

When a satisfactory plan has been drawn up it will be possible to allocate the values and rates per square foot which have been allowed for each broad element to the individual elements. For example, the value shown for "structure" can be divided into the elements comprising "structure". These are:

Work below ground floor level
Frame (if applicable)
External walls
Roof construction
Roof coverings
Upper floor construction

Figure 4 continues this example and shows this stage of the development of the cost plan. This illustrates the structural allowances for the building as a whole and the fitting out allowances for each department.

When the allocation to individual elements has been completed and agreed by all concerned, it will be possible to start a series of cost checks for individual elements against the design. These cost checks can best be carried out by means of approximate quantities priced at rates which reflect the proposed specification. The pricing of several alternative specifications for a particular element may have to be carried out before a satisfactory solution is found.

Savings disclosed in one or more elements can be used, if this is necessary, to vary the specification standards of other elements and the cost plan can be adjusted accordingly. The aim should be to produce a final cost plan which is within the final cost limit for the scheme and which reflects the importance which the architect and engineer place on the various aspects of construction, fittings and finish, by the time the working drawings have been completed.

Bills of quantities

The use of bills of quantities designed in such a way that tender costs can be compared with the cost plan is desirable. This will also provide information for use in connection with future schemes of a similar nature and specification.

Departments	*Ward units*		*Physiotherapy*		*X-ray*		*Communications*		*Totals*	
Total value (£)	141,445		24,801		35,812		11,250* 23,250		213,308* 225,308	
Areas (f.s.)	25,800		5,213		6,690		3,000		40,703	
Permissible cost per f.s. ...	s. d. 109 7.77		s. d. 95 1.81		s. d. 107 0.73		s. d. 75 0* 155 0		s. d. 110 8.50	
Deduct reserve (say) ...	2 7.77		2 1.81		2 6.73		4 0		2 8.03 (£5,432)	
Net permissible cost per f.s.	107 0		93 0		104 6		151 0		108 0.47 (£219,876)	
Elements	*Rate f.s.*	*Total Value*	*Rate f.s.*	*Total Value*	*Rate f.s.*	*Total Value*	*Rate f.s.*	*Total Value*	*Rate f.s.*	*Total Value*
Non-constructional ...	s. d. 5 9	£ 7,417	s. d. 5 9	£ 1,499	s. d. 5 9	£ 1,924	s. d. 5 9	£ 863	s. d. 5 9	£ 11,703
Structural	32 9	42,248	36 0	9,383	35 3	11,791	16 3	2,438	32 4.33	65,860
Staircases	—	—	—	—	—	—	20 6	3,075	1 6.13	3,075
External doors and windows	3 9	4,837	3 9	977	3 9	1,254	4 0	600	3 9.22	7,668
Internal partitions and doors	6 5	8,277	6 3	1,629	8 3	2,760	2 3	337	6 4.67	13,003
Finishings	13 4	17,200	14 6	3,780	14 9	4,934	15 0	2,250	13 10.06	28,164
Joinery and sanitary fittings	7 3	9,353	5 9	1,499	8 0	2,676	6	75	6 8.21	13,603
Services	37 9	48,698	21 0	5,473	28 9	9,617	9 0	1,350	32 0.08	65,138
Lifts...	—	—	—	—	—	—	77 9	11,662	5 8.77	11,662
TOTALS	107 0	138,030	93 0	24,240	104 6	34,956	151 0	22,650	108 0.47	219,876

**Excluding lifts.*

Figure 3. Outline cost plan for multi-department building.

AREA—40,703 f.s. FINAL COST LIMIT £225,308

	Rate s. d.	£
Non-constructional items:		
Preliminaries and insurance	3 7½	7,378
Contingencies	2 1½	4,325
	5 9	11,703
Structural items:		
Work below ground floor level	6 0	12,211
Frame	10 0	20,352
External walling	7 9	15,773
Roof construction	2 0	4,070
Roof coverings	2 4.25	4,791
Upper floors construction	4 3.08	8,663
	32 4.33	65,860

Fitting out items:

	Ward units 25,800 f.s.		*Physiotherapy* 5,213 f.s.		*X-ray* 6,690 f.s.		*Communications* 3,000 f.s.		Rate s. d.	£
	s. d.	£	s. d.	£	s. d.	£	s. d.	£		
Staircases	—	—	—	—	—	—	20 6	3,075	1 6.13	3,075
Windows and external doors	3 9	4,838	3 9	977	3 9	1,254	4 0	600	3 9.22	7,669
Internal partitions	2 9	3,547	2 10	739	4 11	1,645	2 3	337	3 0.96	6,268
Internal doors	3 8	4,730	3 5	891	3 4	1,115	—	—	3 3.72	6,736
Wall finishes	2 9	3,547	3 9	977	3 9	1,254	4 0	600	3 1.61	6,378
Floor finishes	7 2	9,245	7 0	1,825	7 3	2,425	7 3	1,088	7 1.99	14,583
Ceiling finishes	1 8	2,150	1 9	456	1 9	585	1 9	262	1 8.36	3,453
Decorations	1 9	2,257	2 0	521	2 0	669	2 0	300	1 10.10	3,747
Joinery fittings	3 3	4,193	3 3	847	4 11	1,645	6	75	3 3.86	6,760
External plumbing	5	537	3	65	6	167	—	—	0 4.54	769
Sanitary fittings	3 7	4,623	2 3	586	2 7	864	—	—	2 11.81	6,073
Mechanical engineering	16 0	20,640	12 0	3,128	14 3	4,767	5 0	750	14 4.67	29,285
Electrical engineering	12 3	15,803	6 9	1,759	12 3	4,098	2 4	350	10 9.78	22,010
Equipment	8 9	11,288	9	196	9	251	—	—	5 9.19	11,735
Lifts	—	—	—	—	—	—	77 9	11,662	5 8.76	11,662
Building work in connection with engineering	9	967	1 6	391	1 6	502	1 8	250	1 0.44	2,110
Reserve	2 7.77	3,415	2 1.81	561	2 6.73	856	4 0	600	2 8.03	5,432
TOTALS	71 1.77	91,780	53 4.81	13,919	66 0.73	22,097	133 0	19,949	72 7.17	147,745

Final cost limit £225,308

Figure 4. Detailed cost plan for multi-department building.

Glossary of terms

1. *Hospital department.* Any group of accommodation which has a separate function within a hospital.

2. *Basic accommodation.* That part of a hospital department which is common to all departments of that kind.

3. *Additional accommodation.* Space which is required extra to the basic accommodation to serve a particular need.

4. *Functional unit.* Basic accommodation is provided to serve a particular purpose and that purpose or function can usually be defined by reference to the number of units which it is to accommodate or provide. Each unit becomes the functional unit, e.g.

Ward block	beds
Kitchen	meals

   In the above examples the bed and the meal are the functional units.

5. *Additional engineering.* Special engineering works or services which are required extra to those normally provided for a department to serve some special need, e.g. extensive use of piped oxygen.

6. *Ancillary accommodation.* A descriptive term only, indicating the service rooms supporting major accommodation.

7. *Circulation.* The spaces provided to link together the rooms of a department.

8. *Communications.* The enclosed spaces providing access to or communication between the various departments of the hospital. This term includes:
   (*a*) floors, including staircases
   (*b*) lifts

9. *Schedule of accommodation.* Details of the accommodation required, measured between walls. This should be expressed in terms of basic accommodation, additional accommodation, and circulation.

10. *Gross floor area* is the total floor area of the building in square feet, within and excluding the external walls.

11. *External works* comprise:
    (*a*) Building
       (i) Drainage
       (ii) Roads, paths, pavings, boundary walls and fences
       (iii) Builder's work in connection with engineering mains
       (iv) Site layout and planting
    (*b*) *Engineering*
       (i) *Supplies.* This will include the whole of the engineering mains outside the confines of particular departments including any new or reinstated mains which are required in existing buildings to serve new work. It includes cold water mains and storage, steam and condense mains, electricity cables and additional works such as calorifiers, pumps or new boilers or sections to an existing installation. A complete new boiler installation, whether in the building or outside, is treated as a hospital department. For cost limit purposes the items are to be shown separately.
       (ii) *Other engineering.* This will include street lighting, static water tanks and external fire hydrants.

12. *Abnormals* are exceptiona factors which may increase the cost of individual schemes, such as site difficulties, e.g. soil conditions. Demolition works and alteration to existing buildings are included under this heading.

13. *Auxiliary buildings.* Separate buildings which are required to serve the main buildings, e.g.
    Cycle sheds
    Electricity sub-stations
    Small boiler-houses or boiler-rooms, pump house to serve isolated buildings such as nurses' home.

14. *Cost analysis* is the systematic breakdown of costs, according to the sources from which they arise, into factors convenient for the purpose of examining and comparing costs. The factors may be elements, techniques, trades, etc.

15. *Departmental cost allowances.* These are the figures to be used in calculating the cost limits for hospital departments. They are sub-divided into:
    (*a*) Initial allowance—The cost allowed for a minimum number of functional units.
    (*b*) Additional allowance—The cost allowed for additional functional units.
    (*c*) Square foot rate—To be applied to the area of additional accommodation.

16. *Cost limit.* A cost limit is a financial ceiling representing what the cost of a scheme ought to be, and to which the design detail should conform. It is prepared at two stages:
    Provisional cost limit which accompanies schedules of accommodation.
    Final cost limit which accompanies sketch plans.

17. *Cost control* is a generic term embracing all techniques of controlling costs throughout the various stages of a project from its inception to completion.

18. *Rate per square foot* is used in calculating the cost of areas other than basic accommodation. Measurement of the area is to the internal face of external walls.

19. *Elements* are the component parts of a building and are broadly:
    (*a*) Non-constructional items
    (*b*) Structure
    (*c*) Partitioning
    (*d*) Finishings
    (*e*) Fittings
    (*f*) Services
    (*g*) External works
    These broad elements can again be sub-divided; e.g. external walls and the roof are part of the structure. A list and description of the elements used by the Ministry are in Appendix B.

20. *Cost plan.* The cost plan is a statement of how much it is intended to spend on each factor of a proposed building within the cost limit.

21. *Cost planning* is a process of controlling the cost of a project within the cost limit during the design stage. It includes the preparation of a cost plan and the subsequent process of cost checking.

22. *Cost checking* is a process of estimating the cost of the proposed design of each factor and checking it against the cost target set in the cost plan.

List and descriptions of elements

NON-CONSTRUCTIONAL ELEMENTS

1. Preliminaries and insurances (i.e. all costs itemised in the Preliminary bill and costs against items in the summary such as "water for the works", "national insurance contributions", "employer's liability", etc.).	*Items in contract and preliminary clauses.* *Items of insurance and other clauses normally at the end of the summary.*
2. Contingencies.	*The sum covered by the contingency clause.* *Any P.C. sums for labour and materials in daywork with any percentage additions inserted by the contractor.*

STRUCTURAL ELEMENTS

3. Work below ground floor level (i.e. all works below the underside of the floor screed).	*All excavations.* *Disposal of soil.* *Planking and strutting.* *Concrete in foundations.* *Filling under floors.* *Concrete floor slab.* *Damp-proof membrane.* *Damp-proof courses.* *Service ducts and crawlways.* *Duct covers.* *Basements structurally.* (Note: *Doors, windows, partitions, finishings, fittings, services, etc., to be allocated to their respective elements*). *Brickwork in foundations.* *Piling.*
4. Frame and structural internal walls.	*Steel, concrete or timber frame including formwork fixing, details of frames and concrete cover to steelwork.* *Main and secondary floor beams (as these members are often included in the P.C. sum for the frame).* *All formations on columns and beams.* *Internal walls which are primarily structural.*
5. External walls (i.e. the enclosing walling to the building and the finish on the external face. It does not include the finish on the internal face, which is included in wall finishings).	*Brick, concrete or block walls including facing bricks, rendering, etc.* *Plinth and string courses.* *Cills, lintels and copings.* *Thresholds and steps.* *Cavity trays over openings in hollow walls.* *Canopies.* *Curtain walling including glazing.* *Parapet walls, copings and guard railings.* *Chimney stacks and flues where part of the external wall.*
6. External doors and windows (i.e. including sub-frames, ironmongery and glass).	
7. Roof construction.	*Wall plates and roof timbers.* *Eaves, soffits and fascia.* *Steel or concrete beams not included in the frame element.* *Metal roof trusses.* *Templates.* *Reinforcement.* *Formwork.* *Concrete flats or slabs.* *Walkways in roofs.* *Ceiling joists.*
8. Roof coverings.	*Roof or dome lights including glazing and curbs.* *Sarking, battens, tiles or slates.* *Screeds and fillets.* *Boarding.* *Insulation above ceiling finish level.* *Asphalt.* *Bituminous felt coverings.* *Metal roof coverings.* *Flashings, valley and parapet gutters.*

9. Upper floor construction (i.e. the floor slabs and supports exclusive of floor finishes and screed and ceiling finishes and supports).	*Beams not included under frame element.* *Templates.* *Brick piers used for support of beams only.* *Concrete or hollow tile floors.* *Reinforcement.* *Formwork.* *Balconies.* *Constructional work only* *(i.e. edge beams, curbs, trimming) in connection with observation panels over operating theatres.*
10. Staircases (i.e. the stringers, steps and lands and balustrades, exclusive of step and land finishes and screeds and soffit finishes).	*Stringers, steps and landings.* *Balustrades and handrails.*
PARTITIONING ELEMENTS	
11. Internal partitions (i.e. any wall partition or screen used to divide up the floor area into smaller spaces).	*Partitions.* *Glazed screens.* *Folding and sliding doors used for the division of rooms.* *Lintels over openings in partitions.* *Borrowed lights.*
12. Doors (internal) (i.e. including frames, ironmongery and glass).	*Doors and fanlights over door frames.* *Architraves.* *Cramps and dowels.* *Ironmongery.*
FINISHING ELEMENTS	
13. Wall finishes (including screeds and preparatory work).	*Internal facings.* *Plaster.* *Wall tiling.* *Screeds.* *Raking out joints of brickwork or hacking concrete.* *Battening out.* *Sheet finishes.*
14. Floor finishes (including screeds and skirtings).	*Floor finishings.* *Screeds.* *Skirtings.* *Insulation on floors.* *Finishes to stairs.* *Anti-static floor and wire mesh.*
15. Ceiling finishes (including any special supports and finishings to beams and any preparatory work).	*Plaster.* *Expanded metal lath, rods and hangers*.* *Boards and battens.* *Hacking concrete.* *Finishings to beams.* *Cradling to beams.* *Cornices.* *Cover at junction with wall finishes.* *Stair soffits.* *Fibrous plaster.* (*Note: *Steel lath, if used as formwork and reinforcement to concrete in addition to providing a key for plastering, would be included under roof or upper floor construction.*)
16. Decorations.	*All decoration.* *Murals.* *Sculpture.* *Signwriting.*
FITTING ELEMENTS	
17. Fittings (i.e. all other items not included in any other element, and in particular, items not essential to the structure or finish of the building but required for its proper use as a hospital department).	*Storage and equipment shelving.* *Curtain tracks.* *Foot-scrapers.* *Clocks.* *Window-cills.* *Venetian blinds, sun blinds and X-ray blinds.* *Linings and access doors to linen chutes and hatches.* *Observation panels and lay lights to operating theatres.* *Sign boards.* *Cat-ladders.* *Storage racks.* *Changing-room benches.* *Draining-boards.* *Laboratory and work benches* *Telephone kiosks.* *Lockers and cabinets.*

18. Furniture (built-in) and furnishings.	*Cupboards and wardrobes.* *Curtains.* *Mirrors.*
SERVICES ELEMENTS (BUILDING)	
19. Plumbing (external) (i.e. all items necessary to convey rainwater from the roof to the drains).	*R.W. gutters and downpipes.*
20. Sanitary fittings and wastes.	*Sanitary fittings including traps and fittings.* *Toilet-paper holders.* *Toilet rails.* *Soil, anti-syphonage and ventilating pipes.* *Overflows.*
SERVICES ELEMENTS (ENGINEERING)	
21. Mechanical engineering (i.e. those portions of all mechanical engineering services within the building or department).	*Hot and cold water services from points of entry into the department. Steam and condense services within the department.* *Heating systems excluding calorifiers, boilers and boiler plant and flue unless provided solely for one department.* *Ventilation and air conditioning systems.* *Gas systems.* *Medical gases.* *Suction and vacuum.* *Pneumatic systems.* *Cold storage plants.* (Note: *Although the whole of the hot and cold water services have been shown for convenience under this heading, the actual division of this work will depend on local practice and the circumstances under which the work is carried out.*)
22. Electrical engineering (i.e. all electrical services and fittings from the point of entry into the building or department).	*Main switch gear for the building or department.* *Distribution boards and sub-main cables.* *Lighting and power installation.* *Emergency lighting systems.* *Electrical work for mechanical services.* *Patients' and staff call systems.* *Telephones.* *Clocks.* *Radio and television.* *Fire alarm systems.*
23. Fixed equipment.	*Cooking, laundry, dishwashing, sterilising and fire-fighting equipment.*
24. Lifts.	*All work normally executed by the specialist lift contractor.*
25. Builder's work in connection with any of the foregoing electrical and mechanical elements within the building or department.	(Note: *The construction of lift shafts and motor rooms will be included in the structural elements.*)
EXTERNAL WORKS ELEMENTS	
26. Drainage.	*All drainage work up to and including gullies and connections to w.c's, soil and vent pipes.*
27. Roads, paths, pavings, boundary walls and fences.	*Includes steps, retaining walls, railings and car parks.*
28. Engineering.	*Water carrying mains—water storage of all kinds.* *Steam and condense mains.* *Electrical mains.* *Gas mains.* *Road lighting.* *Boiler and calorifier plants.* *Sewage treatment plants.* (Note: *New boiler houses are treated as a separate department.*)
29. Builder's work in connection with engineering (item 28).	*The whole of the builder's work required in connection with item* 28.
30. Site layout and planti	*Site clearance, site works and demolition.* *Horticultural and arboricultural work.*

Specimen analyses

INTRODUCTION

The following specimen analyses of departments show some of the sample schemes examined by the Ministry with their costs broken down into elemental rates. These have been included to illustrate the suggested method of elemental analysis. The check rates are not intended to be used directly for estimating purposes, but are put forward as a guide in the preparation of cost plans.

It should be noted that in general, small departments are relatively more expensive than larger departments. The main reason for this is that equipment and facilities have to be provided in the small departments to a minimum scale which could serve larger units. It has also been found that ancillary accommodation does not necessarily increase in direct proportion to the basic accommodation. The result of this is that the rate per foot super for small departments is higher than for the larger departments. The foot super as a means of estimating therefore has to be used with discretion.

Because a high framed building has different elemental rates from a single storey building, the individual rates for the sub-structure and super-structure elements are less important than the cost of the elements as a whole.

WARD UNITS

SPECIMEN ANALYSES

No.	*ELEMENTS* *Description*	*Scheme 'A'* s. d.	*Scheme 'B'* s. d.	*Scheme 'C'* s. d.	*Scheme 'D'* s. d.	*Scheme 'E'* s. d.	*Scheme 'F'* s. d.	*Check rate* s. d.
1	Preliminaries and insurances	4 3	3 10	4 3	1	5 4	8 6	3 9
2	Contingencies	4 0	—	2 2	3 0		3 8	2 3
		8 3	3 10	6 5	3 1	5 4	12 2	6 0
3	Work below ground floor level	7 5	5 1	8 1	6 9	17 8	11 2	
4	Frame	—	9 11	11 1	—	—	6 5	
5	External walls	7 0	6 2	7 9	7 7	4 11	8 0	
6	External doors and windows	2 4	3 0	2 11	4 8	4 6	4 4	
7	Roof construction ...	6 1	1 3	2 2	3 0	9 9	2 4	
8	Roof coverings and screeds	4 10	1 8	11	2 8	5 4	3 6	
9	Upper floor constructions	—	4 9	4 3	6 9	1	5 3	
10	Staircases	—	1 4	1 3	5	—	9	
		27 8	33 2	38 5	31 10	42 3	41 9	38 6
11	Internal partitions ...	1 9	2 5	3 3	5 0	3 8	2 11	3 3
12	Internal doors	2 10	2 8	3 11	4 0	2 5	3 5	3 3
		4 7	5 1	7 2	9 0	6 1	6 4	6 6
13	Wall finishes	2 5	2 7	2 0	5 4	3 7	4 2	3 3
14	Floor finishes	5 10	7 1	7 2	6 10	5 9	6 3	6 0
15	Ceiling finishes	2 8	1 1	2 9	3 6	1 8	2 5	2 3
16	Decorations	2 3	1 10	2 5	1 9	2 3	2 9	2 6
		13 2	12 7	14 4	17 5	13 3	15 7	14 0
17	Fittings	2 9	1 8	4 2	3 7	6 5	5 6	3 3
18	Furniture and furnishings	—	10	—	—	—	—	—
		2 9	2 6	4 2	3 7	6 5	5 6	3 3
19	Plumbing (external) ...	5	2	3	3	2	2	6
20	Sanitary fittings and wastes	2 9	1 4	3 1	4 2	4 7	3 6	3 6
		3 2	1 6	3 4	4 5	4 9	3 8	4 0
21	Mechanical engineering ...	20 2	17 1	10 10	16 2	17 4	26 6	16 6
22	Electrical engineering ...	17 11	5 6	15 2	11 0	7 11	7 2	12 6
23	Equipment	1 9	3 7	5 1	6 5	14 8	4 0	8 9
24	Lifts	—	13 7	8 3	5 4	—	7 6	—
25	Builder's work in connection with engineering ...	1 3	2	10	10	6	5	1 0
		41 1	39 11	40 2	39 9	40 5	45 7	38 9

Appendix C

SHORT STAY PSYCHIATRIC UNIT

SPECIMEN ANALYSES

No.	*ELEMENTS* *Description*	*Scheme 'A'* s. d.	*Scheme 'B'* s. d.	*Scheme 'C'* s. d.	*Scheme 'D'* s. d.	*Scheme 'E'* s. d.	*Check rate* s. d.
1	Preliminaries and insurances ...	5 6	2 1	6 5	5 11	11 5	3 9
2	Contingencies	3 0	2 10	1 5	4 6	1 6	2 3
		8 6	4 11	7 10	10 5	12 11	6 0
3	Work below ground floor level...	8 0	22 0	5 3	7 6	7 0	
4	Frame	—	1 1	2 11	—	—	
5	External walls	2 5	7 9	3 8	3 9	3 11	
6	External doors and windows ...	6 2	8 8	4 6	8 0	4 10	
7	Roof construction	6 9	4 2	4 1	6 0	9 0	
8	Roof coverings	2 1	5 1	1 5	7 1	5 11	
9	Upper floor construction ...	—	1	3 7	—	—	
10	Staircases	—	1	3	1	1	
		25 5	48 11	25 8	32 5	30 9	38 6
11	Internal partitions	1 8	4 2	5 2	2 6	2 8	3 3
12	Internal doors	3 1	4 0	3 10	3 0	2 5	3 3
		4 9	8 2	9 0	5 6	5 1	6 6
13	Wall finishes	2 6	5 0	2 2	1 10	2 8	3 3
14	Floor finishes	5 1	6 2	7 4	4 6	5 4	6 0
15	Ceiling finishes	11	2 6	1 5	2 0	1 10	2 3
16	Decorations	2 10	3 1	3 1	2 9	1 9	2 6
		11 4	16 9	14 0	11 1	11 7	14 0
17	Fittings	1 3	4 9	3 3	3 3	3 4	3 3
18	Furniture, etc.	—	—	—	—	—	—
		1 3	4 9	3 3	3 3	3 4	3 3
19	Plumbing (external)	2	11	2	2	1	6
20	Sanitary fittings, etc.	3 1	2 4	3 4	2 0	2 2	3 6
		3 3	3 3	3 6	2 2	2 3	4 0
21	Mechanical engineering	9 11	16 3	5 11	14 4	9 6	11 6
22	Electrical engineering	11 10	5 9	5 5	7 6	5 6	8 0
23	Equipment	10	4 4	1 7	—	3	3 9
24	Lifts	—	—	4 2	—	—	—
25	Builder's work in connection with engineering	1 5	1 5	3 8	1 2	1 7	1 0
		24 0	27 9	20 9	23 0	16 10	24 3

Appendix C

X-RAY DEPARTMENTS

SPECIMEN ANALYSES

No.	*ELEMENTS Description*	*Scheme 'A'* s. d.	*Scheme 'B'* s. d.	*Scheme 'C'* s. d.	*Scheme 'D'* s. d.	*Scheme 'E'* s. d.	*Scheme 'F'* s. d.	*Check rate* s. d.
1	Preliminaries and insurances	5	10	1 11	2 9	2 9	1 4	3 9
2	Contingencies	3 10	2 4	3 9	2 9	3 10	1 3	2 3
		4 3	3 2	5 8	5 6	6 7	2 7	6 0
3	Work below ground floor level	16 5	14 7	7 7	14 2	15 2	16 3	
4	Frame	—	—	2 7	—	—	5 0	
5	External walls	7 2	11 6	7 9	3 1	11 7	21 3	
6	External doors and windows	5 3	5 5	4 1	1 10	2 7	1 5	
7	Roof construction ...	10 11	6 8	4 6	8 10	7 3	3 11	
8	Roof coverings	6 6	7 11	3 0	4 7	3 9	7 6	
9	Upper floor construction	3	—	5 4	—	—	—	
10	Staircases	—	—	4	1	1	3	
		46 6	46 1	35 2	32 7	40 5	55 7	40 0
11	Internal partitions ...	3 5	6 1	6 4	5 1	3 10	2 7	5 0
12	Internal doors	3 5	8 5	3 4	4 1	3 10	3 5	3 9
		6 10	14 6	9 8	9 2	7 8	6 0	8 9
13	Wall finishes	2 4	8 4	2 10	4 7	3 9	6 7	4 6
14	Floor finishes	6 7	6 4	6 1	6 5	4 11	5 2	6 0
15	Ceiling finishes	1 0	3 10	3 8	2 2	9	5 10	2 3
16	Decorations	2 4	2 8	2 7	2 3	3 1	2 1	2 9
		12 3	21 2	15 2	15 5	12 6	19 8	15 6
17	Fittings	2 5	12 6	4 7	4 0	2 2	7 4	5 3
18	Furniture, etc.	—	—	1	—	—	1 2	—
		2 5	12 6	4 8	4 0	2 2	8 6	5 3
19	Plumbing (external) ...	1 2	2	7	6	5	4	6
20	Sanitary fittings, etc. ...	1 7	2 10	3 11	2 11	1 2	2 1	2 9
		2 9	3 0	4 6	3 5	1 7	2 5	3 3
21	Mechanical engineering ...	14 8	8 5	19 10	22 8	10 6	11 5	14 6
22	Electrical engineering ...	10 11	9 11	17 4	12 11	9 2	9 4	12 6
23	Equipment	—	—	—	4	—	—	1 0
24	Lifts	—	—	—	—	—	—	—
25	Builder's work in connection with engineering ...	5	3 5	1 7	1 7	4 9	1 6	2 0
		26 0	21 9	38 9	37 6	24 5	22 3	30 0

Appendix C

PHYSIOTHERAPY DEPARTMENT

SPECIMEN ANALYSES

No.	*ELEMENTS* *Description*	*Scheme 'A'* s. d.	*Scheme 'B'* s. d.	*Scheme 'C'* s. d.	*Scheme 'D'* s. d.	*Scheme 'E'* s. d.	*Scheme 'F'* s. d.	*Check rate* s. d.
1	Preliminaries and insurances	2 9	3 10	1 4	10	8 4	1 0	3 9
2	Contingencies	2 9	2 9	1 3	2 6	6 0	1 10	2 3
		5 6	6 7	2 7	3 4	14 4	2 10	6 0
3	Work below ground floor level	14 2	15 2	16 3	6 3	12 10	12 7	
4	Frame	—	—	5 0	—	5 5	4 7	
5	External walls	3 1	11 7	21 3	9 11	5 10	8 6	
6	External doors and windows	1 10	2 7	1 5	4 9	4 10	4 4	
7	Roof construction ...	8 10	7 3	3 11	6 0	2 11	5 11	
8	Roof coverings	4 7	3 9	7 6	4 7	6 10	4 0	
9	Upper floor construction	—	—	—	—	—	8 6	
10	Staircases	1	1	3	—	—	1 1	
		32 7	40 5	55 7	31 6	38 8	49 6	41 0
11	Internal partitions ...	5 1	3 10	2 7	2 3	5 1	1 10	3 3
12	Internal doors	4 0	3 10	3 5	3 0	2 0	3 6	3 3
		9 1	7 8	6 0	5 3	7 1	5 4	6 6
13	Wall finishes	4 7	3 9	6 7	3 1	2 1	4 1	3 9
14	Floor finishes	6 5	4 11	5 2	4 10	4 6	8 0	6 0
15	Ceiling finishes	2 2	9	5 10	1 2	3 7	3 6	2 3
16	Decorations	2 3	2 9	2 1	3 0	2 5	3 1	2 9
		15 5	12 2	19 8	12 1	12 7	18 8	14 9
17	Fittings	4 0	2 2	7 4	4 8	2 0	2 6	3 3
18	Furniture, etc.	—	—	1 2	—	—	—	—
		4 0	2 2	8 6	4 8	2 0	2 6	3 3
19	Plumbing (external) ...	6	5	4	10	6	4	6
20	Sanitary fittings, etc. ...	2 11	1 2	2 1	1 0	1 1	2 11	2 3
		3 5	1 7	2 5	1 10	1 7	3 3	2 9
21	Mechanical engineering ...	9 8	8 1	10 7	8 1	11 0	10 7	12 0
22	Electrical engineering ...	4 6	4 4	5 4	4 9	5 0	6 4	6 9
23	Equipment	6	1 0	1 4	11	10	6	9
24	Lifts	—	—	—	—	—	—	—
25	Builder's work in connection with engineering ...	1 7	4 9	1 6	1 0	1 9	1 10	1 9
		16 3	18 2	18 9	14 9	18 7	19 3	21 3

Appendix C

KITCHENS

SPECIMEN ANALYSES

No.	ELEMENTS Description	Scheme 'A' s. d.	Scheme 'B' s. d.	Scheme 'C' s. d.	Scheme 'D' s. d.	Scheme 'E' s. d.	Scheme 'F' s. d.	Scheme 'G' s. d.	Scheme 'H' s. d.	Check rate s. d.
1	Preliminaries and insurances...	4 0	5 5	1 5	1 1	3 3	6 7	3 4	4 6	3 9
2	Contingencies	1 10	2 4	2 4	6 6	1 6	4 0	1 1	2 6	2 3
		5 10	7 9	3 9	7 7	4 9	10 7	4 5	7 0	6 0
3	Work below ground floor level	12 3	13 4	3 11	6 4	8 7	11 10	9 10	10 11	
4	Frame	—	—						2 3	
5	External walls	11 6	8 11						3 3	
6	External doors and windows...	3 4	1 9	18 1	32 7	32 2	24 4	29 4	3 1	
7	Roof construction	8 3	8 9						8 8	
8	Roof coverings	7 10	7 0						6 7	
9	Upper floor construction ...	—	—	—	—	—	—	—	—	
10	Staircases	—	—	—	—	—	—	—	—	
		43 2	39 9	22 0	38 11	40 9	36 2	39 2	34 9	39 0
11	Internal partitions	4 8	3 7	4 3	4 3	5 4	4 10	4 10	3 0	3 3
12	Internal doors	2 5	2 6						1 5	2 3
		7 1	6 1	4 3	4 3	5 4	4 10	4 10	4 5	5 6
13	Wall finishes	5 3	6 2						2 1	3 9
14	Floor finishes	7 2	7 10	9 7	7 10	13 7	12 8	14 1	5 11	6 3
15	Ceiling finishes	2 9	2 1						2 0	2 3
16	Decorations	1 8	2 6						1 5	2 0
		16 10	18 7	9 7	7 10	13 7	12 8	14 1	11 5	14 3
17	Fittings	2 7	3 10	11	9	1 8	2 1	3 4	2 2	4 9
18	Furniture, etc.	2	2	—	5 10	11 3	3 3	—	1	—
		2 9	4 0	11	6 7	12 11	5 4	3 4	2 3	4 9
19	Plumbing (external)	1 5	4	5	1 8	1 4	3	6	2	6
20	Sanitary fittings, etc.	1 10	2 1	3 4	1 3	1 9	4 11	4 8	2 9	2 3
		3 3	2 5	3 9	2 11	3 1	5 2	5 2	2 11	2 9
21	Mechanical engineering ...	32 9	26 6	24 2	16 0	28 7	17 2	23 4	19 6	23 6
22	Electrical engineering ...	5 6	5 7	6 5	9 9	8 4	8 0	9 1	6 7	10 6
23	Equipment	37 4	41 3	36 4	46 8	45 4	49 10	44 6	53 1	43 0
24	Lifts	—	—	—	—	—	—	—	—	—
25	Builder's work in connection engineering	5 2	1 3	1 2	1 1	1 4	9	7	7	1 3
		80 9	74 7	68 1	73 6	83 7	75 9	77 6	79 9	78 3

Appendix C

DINING-ROOMS

SPECIMEN ANALYSES

No.	*ELEMENTS* *Description*	*Scheme 'A'* s. d.	*Scheme 'B'* s. d.	*Scheme 'C'* s. d.	*Scheme 'D'* s. d.	*Scheme 'E'* s. d.	*Check rate* s. d.
1	Preliminaries and insurances ...	1 1	4 0	5	4 6	3 4	3 9
2	Contingencies	6 6	1 10	1 4	2 6	1 2	2 3
		7 7	5 10	1 9	7 0	4 6	6 0
3	Work below ground floor level...	6 4	12 3	4 4	10 11	9 10	
4	Frame		—	7 9	2 3		
5	External walls		11 6	4 9	3 3		
6	External doors and windows ...		3 4	8 3	3 1		
7	Roof construction	32 7	8 3	4 7	8 8	29 4	
8	Roof coverings		7 10	1 9	6 7		
9	Upper floor construction ...		—	3 8	—		
10	Staircases		—	1 10	—		
		38 11	43 2	36 11	34 9	39 2	39 0
11	Internal partitions	4 3	4 8	1 2	3 0	4 10	2 9
12	Internal doors		2 5	1 10	1 5		2 3
		4 3	7 1	3 0	4 5	4 10	5 0
13	Wall finishes		5 3	5 0	2 1		3 3
14	Floor finishes	7 11	7 2	6 5	5 11	14 1	6 0
15	Ceiling finishes		2 9	3 6	2 0		2 6
16	Decorations		1 8	2 0	1 5		2 0
		7 11	16 10	16 11	11 5	14 1	13 9
17	Fittings	9	2 7	1 4	2 2	3 4	3 3
18	Furniture, etc.	5 11	2	2	1	—	—
		6 8	2 9	1 6	2 3	3 4	3 3
19	Plumbing (external)	1 8	1 5	7	2	6	6
20	Sanitary fittings, etc.	1 3	1 10	1 5	2 9	4 8	2 3
		2 11	3 3	2 0	2 11	5 2	2 9
21	Mechanical engineering	6 3	15 6	9 6	5 9	11 6	10 3
22	Electrical engineering	3 7	4 1	6 8	2 10	2 6	4 3
23	Equipment	20 1	19 10	16 10	20 4	20 3	19 0
24	Lifts	—	—	—	—	—	—
25	Builder's work in connection with engineering	—	5 2	1 8	7	—	1 3
		29 11	44 7	34 8	29 6	34 3	34 9

Appendix D

Schedule of Accommodation and Provisional Cost Limit of Department

Hospital/Site
Long steading

Description of Works
Redevelopment—Phase

Department
No. 3/30 Bed medical ward units. Total: 90 beds

SCHEDULE OF ACCOMMODATION

Basic accommodation

Room	*No. of rooms*	*Area of each*	*Total*
	No.	*sq. ft.*	*sq. ft.*
Single bed wards	4	120	480
	2	170	340
4-bed bays	6	350	2,100
Dayroom/Dining room	1	450	450
Treatment room	1	180	180
Clean utility	1	100	100
Dirty utility	1	100	100
Bathrooms	1	120	—
	1	90	—
	1	40	250
Ablution facilities	—	—	200
W.C's	—	—	270
Sluice rooms	2	100	200
Test rooms	2	20	40
Sister's office	1	120	120
Nurse's station	2	80	160
Nurses' changing rooms (m. and f.)	2	100	200
Kitchen	1	120	120
Linen bays	2	25	50
Stores	—	—	80
Cleaner's room	1	50	50
Trolley bay	1	40	40
Flower room	1	50	50
Sundry facilities (ducts, switch rooms, etc.)	—	—	200
Total for one 30 bed ward unit			5,780
			×3
TOTAL (NET) FOR THREE 30 BED WARD UNITS			17,340
CIRCULATION		ADD 35%	6,069
TOTAL OF BASIC ACCOMMODATION			23,409

Additional accommodation

Room	*No. of rooms*	*Area of each*	*Total*
	No.	*sq. ft.*	*sq. ft.*
Visitors' waiting room and lavatory (D/I patients) } (Alternative doctor's room and lavatory)	3	250	750
Ward waiting area	3	250	750
TOTAL (NET)			1,500
CIRCULATION		ADD 35%	525
TOTAL OF ADDITIONAL ACCOMMODATION			2,025

PROVISIONAL COST LIMIT OF DEPARTMENT

Basic accommodation

NUMBER OF FUNCTIONAL UNITS 90	TYPE ... ... BEDS
	£
ALLOWANCE FOR FIRST 30 BEDS	53,500
ALLOWANCE FOR 60 BEDS AT £1,300 PER BED	78,000
TOTAL	131,500

Additional accommodation

2,025 f.s. at £5 2s. 0d.	10,327
TOTAL	10,327

Additional engineering

NIL	—
TOTAL	—

TOTAL PROVISIONAL COST LIMIT OF DEPARTMENT	141,827

Appendix D

Provisional Cost Limit of Works

Hospital/Site
Long steading

Description of Works
Redevelopment—Phase I

PROVISIONAL COST LIMITS OF DEPARTMENTS

Departments	£
Wards	141,827
X-ray department } *The Schedule of Accommodation and the Provisional Cost Limit for these departments*	35,860
Physiotherapy department } *would be prepared in the same way as the example for ward units.*	24,740
TOTAL PROVISIONAL COST LIMITS OF DEPARTMENTS	202,427

COMMUNICATIONS

COMMUNICATIONS Plus 10%	20,242
LIFTS	
1 Bed lift } 4 levels	9,095
1 4 Passenger lift } 4 levels	3,105
TOTAL OF COMMUNICATIONS	32,442
TOTAL	234,869

NO. OF STOREYS

Not exceeding 4 storeys—NIL	—

EXTERNAL WORKS

BUILDING	*a. Drainage*		
	b. Roads		
	c. Boundary walls	Say 5% of £234,869	11,743
	d. Site layout		
	e. Builder's work in connection with engineering		
ENGINEERING	*a. Supplies*	Say 5% of	
	b. Other engineering works	£234,869	11,743
TOTAL			23,486

AUXILIARY BUILDINGS

Cycle shed	500
Calorifier house	1,500

ABNORMALS

NIL	—
TOTAL PROVISIONAL COST LIMIT OF WORKS	£260,355

Appendix D

Schedule of Accommodation and Final Cost Limit of Department

Hospital/Site
Long steading

Description of Works
Redevelopment—Phase

Department
No. 3/30 Bed medical ward units. Total: 90 beds

SCHEDULE OF ACCOMMODATION

Basic accommodation

Room	*No. of rooms*	*Area of each*	*Total*
	No.	*sq. ft.*	*sq. ft.*
Single bed wards	4	120	480
	2	170	340
4-bed bays	6	365	2,190
Dayroom/Dining-room	1	520	520
Treatment room	1	190	190
Clean utility	1	120	120
Dirty utility	1	120	120
Bathrooms	1	130	—
	2	60	250
Ablution facilities	—	—	220
W.C's	—	—	250
Sluice rooms	2	105	210
Test rooms	2	25	50
Sister's office	1	120	120
Nurse's station	2	75	150
Nurses' changing rooms (m. and f.)	2	90	180
Kitchen	1	140	140
Linen bays	2	25	50
Stores	1	40	—
	2	25	90
Cleaner's room	1	50	50
Trolley bay	1	50	50
Flower room	1	60	60
Sundry facilities (ducts, switch rooms, etc.)	—	—	80
Total for one 30 bed ward unit	—	—	5,910 ×3
TOTAL (NET) FOR THREE 30 BED WARD UNITS			17,730
CIRCULATION		*As measured*	6,120
TOTAL OF BASIC ACCOMMODATION			23,850

Additional accommodation

Room	*No. of rooms*	*Area of each*	*Total*
	No.	*sq. ft.*	*sq. ft.*
Visitors' waiting room and lavatory (Alternative doctors' room and lavatory)	3	240	720
Ward waiting area	3	220	660
TOTAL (NET)			1,380
CIRCULATION		*As measured*	570
TOTAL OF ADDITIONAL ACCOMMODATION			1,950
TOTAL AREA OF DEPARTMENT			25,800

FINAL COST LIMIT OF DEPARTMENT

Basic accommodation

NO. OF FUNCTIONAL UNITS 90	TYPE ... Beds
	£
ALLOWANCE FOR FIRST 30 BEDS	53,500
ALLOWANCE FOR 60 BEDS AT £1,300 PER BED	78,000
TOTAL	131,500

Additional accommodation

1950 f.s. at £5 2s. 0d.	9,945
TOTAL	9,945

Additional engineering

NIL	—
TOTAL	—

TOTAL FINAL COST LIMIT OF DEPARTMENT	141,445

Appendix D

Final Cost Limit of Works

Hospital/Site
Long steading

Description of Works
Redevelopment—Phase I

FINAL COST LIMITS OF DEPARTMENTS

Departments	£
Ward units X-ray department Physiotherapy department } *The Schedule of Accommodation and Final Cost Limits for these departments would be prepared in the same way as the example for ward units.*	141,445 35,812 24,801
TOTAL FINAL COST LIMITS OF DEPARTMENTS	202,058

COMMUNICATIONS

COMMUNICATIONS 3,000 f.s. at £3 15s. 0d.				11,250
LIFTS 1 Bed lift 1 4 Passenger lift	4 levels	As engineer's estimate		12,000
TOTAL OF COMMUNICATIONS				23,250

TOTAL	225,308

NO. OF STOREYS

Not exceeding 4 storeys	—

EXTERNAL WORKS

BUILDING	*a. Drainage*	Approximate estimates.		3,500
	b. Roads			2,500
	c. Boundary walls			500
	d. Site layout			1,000
	e. Builder's work for engineering works			1,500
ENGINEERING	*a. Supplies:*			
	(i) Steam mains			3,000
	(ii) Calorifiers and pumps			6,300
	(iii) Electricity mains			500
	(iv) Water mains			200
	b. Other engineering works:			
	(i) Street lighting			175
TOTAL				19,175

AUXILIARY BUILDINGS

(i) Cycle shed 325 f.s. at £2 10s. 0d.	813
(ii) Calorifier House 400 f.s. at £3 10s. 0d.	1,400

ABNORMALS

NIL	—
TOTAL FINAL COST LIMIT OF WORKS	246,696

Ministry of Health

The following titles in these series have been issued:

Hospital Building Notes

1.	Buildings for the hospital service	Out of print
2.	The cost of hospital buildings	4s 0d (4s 6d)
4.	Ward units	in prep.
5.	Short stay psychiatric unit	in prep.
6.	Diagnostic X-ray department	in prep.
7.	Accommodation for nursing staff	Out of print
8.	Physiotherapy department	in prep.
9.	Occupational therapy department	1s 3d (1s 6d)
10.	Kitchens	2s 0d (2s 5d)
11.	Dining rooms	1s 3d (1s 8d)
12.	Out-patient department	1s 6d (1s 11d)
13.	Central sterile supply department	1s 6d (1s 9d)
14.	Training school for nurses	1s 6d (1s 9d)
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32.	Psychiatric ward (type 2) and pre-discharge (hostel type) ward	3s 6d (4s 0d)

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1.	Equipping a hospital building	1s 0d (1s 5d)
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32.	Psychiatric ward (type 2) and pre-discharge (hostel type) ward	5s 0d (5s 6d)

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